

Marco D. Giles

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EDUCATION

- Ph.D. – **Tulane University** **2011**
Organic Polymer Chemistry
Advisor: Scott M. Grayson
Thesis: Divergent Polyester Dendronization of Macrocycles as a Platform for the Enhancement of Supramolecular Applications
- B.S. – **University of Arkansas at Pine Bluff** **2003**
Chemistry

PROFESSIONAL EXPERIENCE

- Prairie View A&M University**; Prairie View, TX; *Assistant Professor* **2015 - Present**
- Instructor of Organic Chemistry I, CHEM 2033 and laboratory CHEM 2032
 - Instructor of Organic Chemistry II, CHEM 2043 and laboratory CHEM 2042
 - Instructor of General Inorganic Chemistry I, CHEM 1033; and laboratory, CHEM 1011 and 1021
 - Instructor of Chemistry for Engineers, CHEM 1034
 - Instructor of Identification of Organic Compounds (Spectroscopy), CHEM 5414; graduate course
 - Utilize divergent polyamidoamine (PAMAM), and polyester dendronization techniques for the synthesis and applications of bioreducible dendrimers for drug delivery (*Chemotherapeutic drug delivery and remediation of bacterial antibiotic resistance*)
 - Utilize atom transfer radical polymerization (ATRP), ring-opening polymerization (ROP), and thiol-yne click chemistry for the synthesis and applications of biocompatible, heavy metal chelating nanomaterials for drug delivery, and biological/environmental decontamination (*Lead complexation for water purification and chelation therapy; and polymer-silver complexes for the remediation of bacterial antibiotic resistance*)
 - Coordinator of M.S. chemistry program
 - Co-advisor for Chemistry Club, ACS student chapter
 - Member of PVAMU Undergraduate Faculty Council
- Texas A&M University**; College Station, TX; *Postdoctoral Research Associate* **2014 - 2015**
-Postdoctoral Advisor: Karen L. Wooley
- Synthesize bio-reducible, biocompatible disulfide-containing polyester dendrimers for the efficient delivery of anti-cancer therapeutics
 - Develop synthetic approach for the production of dendrimeric polyphosphoesters with potential drug delivery capabilities
 - Design fully degradable glycerol based polyphosphoesters via ring-opening polymerization for potential drug encapsulation and delivery
 - Design disulfide-containing polycarbonates via condensation step-growth polymerization, and investigate physical, chemical, and mechanical properties

- Responsible for maintenance and training for THF-GPC and Teledyne ISCO Combiflash chromatography system
- Characterize monomers and linear and/or branched polymeric materials utilizing nuclear magnetic resonance spectroscopy (NMR), matrix-assisted laser desorption ionization time of flight mass spectrometry (MALDI-TOF MS), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and infrared (IR) spectroscopy

Baylor College of Medicine; Houston, TX; *Postdoctoral Research Associate*

2011 - 2014

- Mentored undergraduate student for introduction to research laboratory practices and environment
- Mentored SMART program participant for summer research appointment
- Helped with setup of new research laboratory, met with vendors for the selection and testing of essential equipment and instruments
- Investigated the synthesis of disulfide-containing bio-reducible and biocompatible macromolecules for the efficient delivery of anti-cancer therapeutics
- Synthesized multivalent drug carriers through branched polyester dendrimer synthesis
- Served as group safety officer, and was in charge of receiving, organizing, collection, and removal of hazardous materials
- Served as research mentor for undergraduate participant in Summer Medical and Research Training (SMART) Program and coordinated the initiation and progress of a research project
- Satisfied and advanced the mission of the Houston Research Education and Career Horizon Institutional Research and Academic Career Development (REACH IRACDA) Fellow program through workshop attendance for teaching and mentorship, planning undergraduate research symposia
- Served as visiting assistant professor at Prairie View A&M University to teach both sections of sophomore organic chemistry
- Attend workshops for the development of effective teaching techniques
- Assist in planning a local undergraduate research symposium

Tulane University; New Orleans, LA; *Graduate Research Assistant*

2006 - 2011

- Divergently grafted polyester dendrimers from cavitand for surface modification to make successful candidates for drug encapsulation and delivery
- Synthesized polyester-based dendritic initiating cores for Atom Transfer Radical Polymerization (ATRP) to synthesize block co-polymers for trans-dermal drug delivery
- Synthesized alkyne functionalized cavitands to make suitable substrates containing multiple sites for 1,3-dipolar cycloaddition
- Synthesized expanded macrocycles for drug and small molecule encapsulation
- Introduced undergraduate researchers to laboratory and research environment
- Assisted in project initiation for undergraduates, and monitored progress throughout tenure within group
- Served as LSAMP graduate student coordinator
- Characterized linear and branched polymeric materials utilizing nuclear magnetic resonance spectroscopy (NMR), matrix-assisted laser desorption ionization time of flight mass spectrometry (MALDI-TOF MS), dynamic light scattering (DLS), and infrared (IR) spectroscopy

University of New Orleans; New Orleans, LA; Upward Bound Science Instructor **2007 - 2008**

- Taught chemistry and physics to high school students from up to three different school districts within the New Orleans area

AWARDS

Research Education and Career Horizon Institutional Research and Academic Career Development (REACH IRACDA) Award- Baylor College of Medicine **2011**

- NIH K12 funded teaching/research postdoctoral fellowship

Carl Storm Underrepresented Minority Fellowship- Gordon Research Conference **2009**

- Minority scientist travel award

PEER REVIEWED PUBLICATIONS

Giles, M.D.; Wooley, Karen, D., Synthesis and Characterization of Disulfide-Containing Aryl Polycarbonate Materials (In Preparation).

Li, Y.; Giles, M. D.; Liu, S.; Laurent, B. A.; Hoskins, J. N.; Cortez, M. A.; Sreerama, S. G.; Gibb, B. C.; Grayson, Scott M., A Versatile and Modular Approach to Functionalization of Deep-cavity Cavitands via “Click” Chemistry. **Chemical Communications** **2011**, 47, 9036-9038.

Poree, D. E.; Giles, M. D.; Lawson, L. B.; He, J.; Grayson, S. M., Synthesis of Amphiphilic Star Block Copolymers and their Evaluation as Transdermal Carriers. **Biomacromolecules**, **2011**, 12, 898–906.

Giles, M. D.; Liu, S.; Emanuel, R., L.; Gibb, B., C.; Grayson, S., M. Divergent Dendronization of Deep-Cavity Cavitands to Tune Host Solubility. **Israel J. Chem.** **2009**, 49, 31-40.

Giles, M. D.; Liu, S.; Emanuel, R., L.; Gibb, B., C.; Grayson, S., M. Dendronized Supramolecular Nano-Capsules: pH Independent, Water-Soluble Deep Cavity Cavitands via the Hydrophobic Effect. **J. Am. Chem. Soc.** **2008**, 130, 14430-14431.

ABSTRACTS OF CONFERENCE PRESENTATIONS

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, S. M. A Comparative Study: Water Solubility and Binding Efficiency for Dendronized, Supramolecular Hosts. **International Dendrimer Symposium 7**, National Institute for Standards and Technology, Gaithersburg, MD, June 26-July 1, 2011 Poster Presentation.

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, S. M. Synthesis of Water Soluble Cavitands. **Gordon Research Conference**, Mt. Holyoke College, South Hadley, MA, June 20-21, 2009, Polymers-Excellence in Polymer Graduate Research.

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, Scott M. Synthesis of Water Soluble Cavitands. **Gordon Research Conference**, Mt. Holyoke College, South Hadley, MA, June 21-26, 2009, Polymers-Responsive and Multifunctional Polymers Enabling Emerging Technologies.

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, S. M. Synthesis of Dendronized Water Soluble Deep-Cavity Cavitands. **3rd Annual International Symposium on Macrocyclic and Supramolecular Chemistry**, Las Vegas, NV, July 13-18, 2008 Poster Presentation.

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, S. M. Preparation of Dendronized Cavitands for Supramolecular Drug Encapsulation and Delivery. **60th Southeast Regional ACS Meeting**, Nashville, TN, November 12-15 2008, SERM Oral Presentation.

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, S. M. Divergent Polyester Dendronization of Cavitands to Tune Host Solubility. **235th ACS National Meeting**, New Orleans, LA, April 6-10, 2008, PMSE Poster Session.

Giles, M. D.; Eugene, D. M.; Grayson, S. M. Synthesis of Polyester Based dendrimers as Precursors for Amphiphilic Star Block Copolymers. **235th ACS National Meeting**, New Orleans, LA, April 6-10, 2008, PMSE Poster Session.

Giles, M. D.; Liu, S.; Emanuel, R. L. Jr.; Gibb, B. C.; Grayson, Scott M. Divergent Polyester Dendronization of Cavitands to Tune Host Solubility. **235th ACS National Meeting**, New Orleans, LA, April 6-10, 2008, Sci-Mix Poster Session.

Giles, M. D.; Eugene, D. M.; Grayson, S. M. Synthesis of Polyester Based dendrimers as Precursors for Amphiphilic Star Block Copolymers. **235th ACS National Meeting**, New Orleans, LA, April 6-10, 2008, Sci Mix Poster Session.

WORKSHOPS ATTENDED

2014 IRACDA Postdoctoral Conference, University of New Mexico, Albuquerque, NM
2014 Future Faculty Workshop, MIT, Boston, MA
2013 IRACDA Postdoctoral Conference, Emory University, Atlanta, GA
2012 IRACDA Postdoctoral Conference, University of Pennsylvania, Philadelphia, PA

FUNDING

2018 DOD/ARO: DURIP (In Preparation)
2017 NSF: HBCU-UP Research Initiation Award (unfunded; Resubmitting 2018)
2017 NIH: AREA R15 Award (Unfunded)
2017 PVAMU Faculty Research Development Program (Funded, \$20,000)
2015 NSF: MRI Program (Unfunded)
2015 PVAMU Institutional Mini Grant (Funded, \$20,000)